

SEALED, FLEXIBLE FLAT PANEL DISPLAY**CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims priority to and the benefit of Korean Patent Application No. 10-2004-0097521, filed on Nov. 25, 2004, which is hereby incorporated by reference for all purposes as if fully set forth herein.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates to a flat panel display and a method of manufacturing a flat panel display, and more particularly, to a sealed, flexible flat panel display and a method of manufacturing the sealed, flexible flat panel display.

2. Discussion of the Background

Generally, some flat panel displays (FPDs), such as, organic electroluminescent displays (OLEDs), thin film transistor liquid crystal displays (TFT-LCD), etc., may have characteristics allowing them to be made thin and flexible. Accordingly, much research is being conducted into thin, flexible FPDs.

A flexible substrate is used to produce thin, flexible FPDs, and a plastic substrate is typically used as the flexible substrate.

However, because FPDs undergo complicated manufacturing processes, such as formation of an organic film, a thin film transistor layer, an electrode layer, an orientation layer, etc., on a substrate, depending on the particular characteristics of the FPD, when using a plastic substrate, such processes may deform the plastic substrate or thin layers formed on the plastic substrate. Also, plastic is generally less dense than glass.

Furthermore, a plastic substrate may not effectively prevent permeation of water or air.

To solve this problem, a plastic substrate may be coated with a barrier layer to block permeation of water or air.

For example, U.S. Pat. Nos. 6,268,695 and 6,497,598 disclose an organic light emitting device encapsulated in a film including polymer layers and a ceramic layer interposed between the polymer layers. U.S. Pat. No. 6,413,645 discloses an organic light emitting device encapsulated in a stack of at least one polymer layer and at least one inorganic layer. U.S. Pat. No. 6,522,067 discloses an organic light emitting device encapsulated in a stack of at least one barrier layer and at least one polymer layer. U.S. Pat. No. 6,548,912 discloses a micro-electronic device encapsulated in a stack of at least one barrier layer and at least one polymer layer. U.S. Pat. No. 6,570,325 disclosed an organic light emitting device encapsulated in a stack where a barrier layer is interposed between decoupling layers. U.S. Pat. No. 6,573,652 discloses a display device encapsulated in a stack of at least one barrier layer and at least one polymer layer.

However, using such a barrier layer, which includes an inorganic film, to encapsulate an FPD, the barrier layer may be too thin, which may degrade its durability. Even when the barrier layer is formed on a flexible plastic substrate, the limit of a process temperature is low, so that manufacturing the FPD may be difficult.

Thus, there is room for improvement in sealing display devices in flexible FPDs.

Korean Patent Publication No. 2003-2946 discloses an organic light emitting device sealed by plastic that is heated and press-fitted onto the light emitting device instead of being adhered by an adhesive. In this case, although sealing can be

simply performed, the plastic may not completely prevent permeation of water and air. This results in degradation of the lifespan and durability of the organic light emitting device.

U.S. Patent Publication No. 2003/0027369 A1 discloses a method of making a light emitting device that is vacuum-sealed with a bag-like plastic film inside of which inorganic insulating films, which can prevent oxygen or water from penetrating therein, and an organic insulating film, which has a smaller internal stress than the inorganic insulating films, are laminated. However, when the plastic film having the inorganic insulative film bends, the inorganic insulative film may crack, leading to degradation of the ability of preventing permeation of water and air.

Japanese Patent Publication No. 1993-144569 discloses a method of manufacturing a light emitting device that is sealed by forming a thermoplastic hygroscopic film on both sides of the light emitting device, heating and press-fitting the film onto the light emitting device to seal all of the device's peripheral parts, and then covering the sealed light emitting device with an outer cover film. However, the thermoplastic hygroscopic film and the outer cover film may not completely prevent permeation of water and air.

SUMMARY OF THE INVENTION

The present invention provides a flexible flat panel display that may be simply manufactured and that may block water and oxygen, and a method of manufacturing the flat panel display.

Additional features of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention.

The present invention discloses a flat panel display including a light emitting device having a sealed image display area. An enclosure is curved to have a space in which the light emitting device is sealed, and a curved portion of the enclosure is rounded.

The present invention also discloses a method of manufacturing a flat panel display including forming a light emitting device by forming an image display area on a substrate and sealing the image display area, seating the light emitting device on an enclosure, enclosing the light emitting device with the enclosure, and sealing edges of the enclosure. A supporter is arranged between a curved portion of the enclosure and the light emitting device.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

FIG. 1 is an exploded perspective view of a flat panel display according to an embodiment of the present invention.

FIG. 2 is a cross-section taken along line I-I of FIG. 1.

FIG. 3 is a cross-section of an example of an image display portion shown in FIG. 1.

FIG. 4 is a cross-section of another example of the image display portion shown in FIG. 1.

FIG. 5 is a magnified cross-section of a portion of a sealing element shown in FIG. 1.